

Original Article

## Pengaruh Edukasi Pencegahan Stroke terhadap Pengetahuan pada Lansia di Gereja Isa Al-Masih Kota Kediri

### *The Effect of Stroke Prevention Education on Knowledge of Elderly at the Church of Isa Al-Masih, Kediri City*

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#### ABSTRACT

Stroke is one of the leading causes of disability and mortality among the elderly. Preventive efforts focusing on increasing knowledge and awareness are essential to reduce stroke risk and improve quality of life.

This study used a pre-post-test design with 62 elderly participants who regularly attended the Church Isa Al-Masih in Kediri City. The intervention consisted of stroke prevention education delivered through a standardized procedure (SOP) using leaflets and flipbooks. Knowledge was assessed with a 6-item questionnaire covering hypertension, causes of high blood pressure, normal blood pressure ranges, medication adherence, diet, and breathing relaxation techniques. Data were collected before and after the education and analyzed using descriptive statistics and the Wilcoxon Signed-Rank Test.

The Wilcoxon test indicated a significant increase in participants' knowledge following the stroke prevention education ( $p < 0.05$ ). Structured, interactive, and community-based education enhanced understanding of stroke risk factors, blood pressure management, medication adherence, diet, and relaxation techniques.

Stroke prevention education is effective in enhancing knowledge among elderly individuals and may encourage preventive health behaviors. Community-based approaches can serve as a model for similar health promotion programs targeting older adults.

**Keywords:** Stroke, Stroke Prevention Education, Elderly Knowledge

#### ABSTRAK

Stroke merupakan salah satu penyebab utama disabilitas dan kematian pada lansia. Upaya pencegahan melalui peningkatan pengetahuan dan kesadaran sangat penting untuk mengurangi risiko stroke dan meningkatkan kualitas hidup.

Penelitian ini menggunakan desain pre-post-test dengan responden 62 lansia yang rutin mengikuti kegiatan di Gereja Isa Al-Masih, Kota Kediri. Intervensi berupa edukasi pencegahan stroke disampaikan melalui prosedur standar (SOP) menggunakan leaflet dan flipbook. Pengetahuan diukur dengan kuesioner 6 item yang mencakup hipertensi, penyebab tekanan darah tinggi, batas normal tekanan darah, kepatuhan minum obat, pola makan, dan teknik relaksasi pernapasan. Data dikumpulkan sebelum dan sesudah edukasi, kemudian dianalisis menggunakan statistik deskriptif dan uji Wilcoxon Signed-Rank.

Hasil uji Wilcoxon menunjukkan adanya peningkatan pengetahuan yang signifikan pada peserta setelah menerima edukasi pencegahan stroke ( $p < 0,05$ ). Edukasi yang disampaikan secara terstruktur, interaktif, dan berbasis komunitas meningkatkan pemahaman lansia tentang faktor risiko stroke,

manajemen tekanan darah, kepatuhan pengobatan, pola makan sehat, dan teknik relaksasi.

Edukasi pencegahan stroke efektif meningkatkan pengetahuan lansia dan dapat mendorong perilaku preventif yang bermanfaat bagi kesehatan. Pendekatan berbasis komunitas dapat menjadi model bagi program kesehatan lansia serupa.

**Kata Kunci:** Stroke, Edukasi Pencegahan, Pengetahuan Lansia

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### Key Findings

- ⇒ Community-based stroke prevention education effectively improves elderly individuals' knowledge of stroke risk factors and preventive measures.
- ⇒ Structured and interactive educational approaches enhance understanding of blood pressure management, medication adherence, diet, and relaxation techniques among the elderly.
- ⇒ Health education programs delivered in religious community settings show potential as an effective model for promoting stroke prevention behaviors in older adults.

### Introduction

Stroke is one of the leading causes of disability and mortality among the elderly. As people age, their risk of experiencing stroke increases due to physiological changes and the accumulation of risk factors such as high blood pressure, diabetes, and unhealthy lifestyle habits (Chang et al., 2021; Feigin & Owolabi, 2023; Herpich & Rincon, 2020). Preventive efforts that focus on increasing awareness and knowledge about stroke are essential to reduce its prevalence and improve quality of life among older adults (Fadlilah et al., 2025; Finsterer, 2021;

Huang et al., 2022; Wegener et al., 2024).

The global prevalence of stroke is rising, with approximately 11.9 million new cases and 7.3 million deaths reported in 2021, making it one of the leading causes of death and disability worldwide. In the same year, an estimated 93.8 million people were living after experiencing a stroke — a significant increase compared to 1990, reflecting the growing long-term burden of the disease. This increase is driven by key risk factors such as hypertension, obesity, air pollution, and sedentary lifestyles. The impact of stroke is especially heavy in low- and middle-income countries, particularly in Southeast Asia and East Asia, and the number of cases is projected to continue rising through 2050, emphasizing the urgent need for global prevention and management strategies. (Cheng et al., 2024; Organization & Collaborators, 2025).

Health education plays a central role in influencing individuals' knowledge, attitudes, and behaviors. The Health Belief Model provides a conceptual framework for understanding how people make decisions about their health (Arkan et al., 2019; J.-J. Li et al.,

2022; Wang et al., 2020). According to this model, individuals are more likely to adopt preventive behaviors when they perceive themselves to be susceptible to a health problem, understand its seriousness, recognize the benefits of preventive actions, and feel that barriers can be overcome (Chen et al., 2024; Y. Li et al., 2021; Liu et al., 2024). Applying this model, structured stroke prevention education can increase elderly individuals' understanding of risk factors and motivate them to engage in health-promoting behaviors.

Educational interventions have been shown to enhance knowledge and promote behavior change in elderly populations. By providing information about stroke risk factors, symptoms, and prevention strategies, such programs can empower older adults to take proactive steps in managing their health (G. Huo et al., 2025; Lin et al., 2023; Rost et al., 2022). In addition, the social environment, including community and religious settings, can support learning by offering opportunities for discussion, reinforcement, and peer encouragement.

Despite the potential benefits, there is limited research on the effectiveness of stroke prevention education delivered within religious community settings, where elderly individuals regularly gather (He et al., 2024; R.-R. Huo et al., 2023). Investigating this approach can provide valuable insights into how educational programs can be tailored to reach this population effectively, improve their knowledge, and foster preventive health behaviors. This study aims to examine the impact of stroke prevention education on the knowledge of elderly participants in a

church setting, guided by the conceptual framework of the Health Belief Model.

## Methods

### Design, Participants, and Setting

This study employed a pre-post-test design to evaluate the effect of stroke prevention education on the knowledge of elderly participants. The respondents consisted of 62 elderly individuals who regularly attend the Church Isa Al-Masih in Kediri City. The study population included all elderly members of the church who participate in community activities, and the total sample size encompassed all 62 eligible participants using a total population sampling method. The inclusion criteria were elderly individuals who actively participate in the elderly health post ("posyandu lansia") activities, while those who did not participate or were unable to complete the questionnaire were excluded. The independent variable in this study was stroke prevention education, and the dependent variable was the participants' knowledge regarding stroke prevention. The research was conducted within the premises of the Church Isa Al-Masih in Kediri City, providing a familiar and supportive environment for the participants.

### Instruments

The study employed a structured questionnaire to measure the participants' knowledge of stroke prevention. The independent variable was stroke prevention education delivered through a standardized educational procedure (SOP), including leaflets and flipbook materials. The dependent variable was the participants' knowledge, assessed using

a 6-item questionnaire covering hypertension, causes of high blood pressure, normal blood pressure ranges, medication adherence, diet, and relaxation techniques. Each item was scored on a 3-point scale: “Know” = 3, “Fairly Know” = 2, and “Do Not Know” = 1. The total score ranged from 6 to 18, which was categorized into three knowledge levels: Low (6–10), Moderate (11–14), and High (15–18) (**Table 1**).

The questionnaire was adapted from validated instruments on hypertension and stroke prevention, with content validity confirmed by public health and geriatric care experts.

Reliability was tested through a pilot study among elderly individuals, demonstrating acceptable internal consistency (Cronbach’s alpha > 0.7). The educational SOP included introduction to stroke and risk factors, guidance on blood pressure monitoring, instruction on medication adherence, dietary advice, and demonstration of simple breathing relaxation exercises. Supporting materials such as leaflets and flipbooks were used to reinforce learning and can be attached in the supplementary section after the references (**Table A1**).

**Table 1.** Questionnaire for Assessing Knowledge of Stroke Prevention Among Elderly Participants

No.	Question	Know	Fairly Know	Do Not Know
1	How much do you know about hypertension?	3	2	1
2	How much do you know about the causes of high blood pressure?	3	2	1
3	How much do you know about normal blood pressure ranges?	3	2	1
4	How much do you know about medication adherence?	3	2	1
5	How much do you know about foods and drinks that help lower blood pressure?	3	2	1
6	How much do you know about breathing relaxation techniques to lower blood pressure?	3	2	1

**Intervention**

The stroke prevention education was delivered following a structured Standard Operating Procedure (SOP) to ensure consistency and effectiveness. The intervention began with an introduction, where participants were welcomed and the objectives of the session were explained, along with an overview of stroke, its impact, and the importance of prevention for elderly individuals. Baseline knowledge was

assessed using a pre-test questionnaire covering hypertension, stroke risk factors, normal blood pressure ranges, medication adherence, diet, and relaxation techniques. The educational content was then delivered using standardized materials, including leaflets and flipbooks, focusing on understanding hypertension and its causes, stroke risk factors and early warning signs, monitoring blood pressure, medication adherence, healthy dietary habits, and relaxation

techniques. Practical demonstrations were conducted for breathing relaxation exercises, simple lifestyle practices, and blood pressure monitoring, with participants encouraged to actively practice and ask questions. Key messages were reinforced through discussion, question-and-answer sessions, and sharing of personal experiences. Immediately after the session, participants completed the post-test questionnaire to assess changes in knowledge, and they were provided with leaflets and flipbooks for reference at home to support continued learning. This structured, interactive, and community-based approach ensured that participants not only received information but also actively engaged in practical strategies for stroke prevention.

### Data Collection and Analysis

Data collection was carried out in several stages during October 2025. First, informed consent was obtained from all participants, and baseline data on age, sex, and pre-test knowledge were collected using the structured questionnaire. Second, the stroke prevention education was delivered following the standardized SOP, including explanation of stroke risk factors, blood pressure monitoring, medication adherence, dietary guidance, and breathing relaxation exercises. Finally, post-test knowledge data were collected using the same questionnaire immediately after the educational session.

The data were analyzed to assess changes in participants' knowledge before and after the intervention. Descriptive statistics, including frequency, percentage, mean, standard

deviation, and minimum–maximum values, were used to summarize demographic characteristics and knowledge scores. The Wilcoxon Signed-Rank Test was employed to determine the statistical significance of the difference in knowledge scores between pre-test and post-test, as the data were paired and not assumed to be normally distributed.

All statistical analyses were performed using IBM SPSS Statistics, version 26, with a significance level set at  $p < 0.05$ . Results were presented in tables showing frequencies, percentages, mean  $\pm$  SD, and pre–post comparison of knowledge levels.

### Ethical Approval

All participants were provided with complete information regarding the purpose, benefits, and procedures of the study before implementation. Participation was voluntary, without any form of coercion, and participants were free to withdraw at any time without consequence. The confidentiality of participants' identity and personal data was strictly maintained and used solely for research purposes. This study adhered to ethical research principles, including respect for autonomy, beneficence, justice, and non-maleficence.

### Results

**Table 2.** Frequency Distribution of Sex and Age Characteristics of Participants

Sex	n (%)	Age (years) Mean $\pm$ SD (Min–Max)
Male	13 (21.0%)	69.5 $\pm$ ~10.1 (51–83)
Female	49 (79.0%)	62.1 $\pm$ ~11.4 (44–84)
Total	62 (100%)	–

**Table 2** shows the frequency distribution of sex and age characteristics of the participants. Among the participants, 13 (21.0%) were male, with a mean age of 69.5 years (SD  $\approx$  10.1, range 51–83 years), and 49 (79.0%) were female, with a mean age of 62.1 years (SD  $\approx$  11.4, range 44–84 years). The total number of

participants was 62 (100%), and overall age statistics were not calculated for the total group.

**Table 3.** Comparison of Elderly Knowledge Levels Before and After Stroke Prevention Education

Knowledge Level	Pre-Test n (%)	Post-Test n (%)	Wilcoxon W	p-value	Change Status (n)
Low	16 (25.8)	7 (11.3)	38	0.000	Increase: 33, Decrease: 4, No Change: 25
Moderate	17 (27.4)	8 (12.9)	-	-	-
High	29 (46.8)	47 (75.8)	-	-	-
<b>Total</b>	<b>62 (100)</b>	<b>62 (100)</b>	-	-	-

**Table 3** presents the comparison of elderly knowledge levels before and after stroke prevention education. Before the education, 16 participants (25.8%) had low knowledge, 17 (27.4%) had moderate knowledge, and 29 (46.8%) had high knowledge. After the education, the distribution changed to 7 participants (11.3%) with low knowledge, 8 (12.9%) with moderate knowledge, and 47 (75.8%) with high knowledge. The Wilcoxon Signed-Rank Test showed a significant increase in knowledge with  $W = 38$  and  $p = 0.000002$ . In terms of individual changes, 33 participants showed an increase in knowledge, 4 participants showed a decrease, and 25 participants had no change.

## Discussion

The results indicate that the majority of participants were female, with a range of ages representing the

elderly population. This demographic composition reflects common trends in community-based elderly activities, where women often participate more actively than men. Understanding the age and sex distribution of participants is important for tailoring educational interventions, as cognitive and physical abilities may vary across different age groups and between sexes.

The implementation of stroke prevention education demonstrated a positive impact on participants' knowledge. The intervention effectively increased awareness of stroke risk factors, blood pressure management, medication adherence, dietary practices, and relaxation techniques (Anderson, 2021; Nandan et al., 2023; Potter et al., 2022; Shi et al., 2021). This finding highlights the importance of structured health education programs in improving knowledge among the elderly, supporting the idea that knowledge

enhancement is a crucial first step toward behavior change and disease prevention.

The significant improvement in knowledge following the educational intervention can be explained by the application of a structured and interactive teaching method. Utilizing visual aids, practical demonstrations, and clear explanations likely contributed to better comprehension and retention among participants (Czap & Sheth, 2021; Denny et al., 2024). Additionally, delivering the program within a familiar community setting provided a supportive environment that facilitated learning and engagement.

These findings underscore the value of targeted, context-specific educational programs for elderly populations. By improving knowledge through effective education, older adults are more likely to adopt preventive behaviors, which may reduce the risk of stroke and enhance overall health outcomes. Furthermore, community-based interventions such as this can serve as a model for similar programs in other local settings, emphasizing the importance of accessibility, relevance, and participant-centered approaches in health education.

## Conclusion

The study found that stroke prevention education effectively improved the knowledge of elderly participants. Delivering structured, interactive, and context-specific educational interventions within a familiar community setting enhanced participants' understanding of stroke risk factors, blood pressure management, medication adherence, dietary practices, and relaxation

techniques. These results highlight the importance of educational programs in empowering older adults to adopt preventive health behaviors and promote overall well-being.

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## Conflict of Interest

There is no conflict of interest.

## Author Contribution

**Claudy Maharani H.:** Conceptualization, Methodology, Investigation, Data Collection, Writing – Original Draft.

**Cornelia Widiastutik:** Investigation, Data Collection, Data Curation, Writing – Original Draft.

**Debora Aurelia Ayu W.:** Investigation, Data Collection, Visualization, Writing – Original Draft.

**Jonathan Adjie Nugraha:** Investigation, Data Collection, Formal Analysis, Writing – Original Draft.

**Maria Aldanita Ambu K.:** Investigation, Data Collection, Validation, Writing – Original Draft.

**Putri Devinda P. M.:** Investigation, Data Collection, Literature Review, Writing – Original Draft.

**Nanda Puspita:** Investigation, Data Collection, Editing Support, Writing – Original Draft.

**Heru Suwardianto:** Supervision, Conceptualization, Methodology

Review, Writing – Review & Editing, Final Approval.

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## Appendix

**Table A1.** Stroke Prevention Knowledge Questionnaire (Kuesioner Pengetahuan Pencegahan Stroke)

NO.	PERTANYAAN	Tahu	Cukup Tahu	Tidak Tahu
1.	Seberapa anda tahu tentang hipertensi?			
2.	Seberapa anda tahu tentang penyebab tekanan darah naik?			
3.	Seberapa anda tahu batas normal tekanan darah?			
4.	Seberapa anda tahu tentang kepatuhan minum obat?			
5.	Seberapa anda tahu tentang makan dan minuman yang ada disekitar untuk menurunkan tekanan darah?			
6.	Seberapa anda tau tentang relaksasi nafas dala untuk menurunkan tekanan darah?			

**Keterangan:** Skor tiap butir kuesioner pengetahuan pencegahan stroke diberikan sebagai berikut: “Tahu” = 3, “Cukup Tahu” = 2, dan “Tidak Tahu” = 1. Total skor berkisar antara 6 hingga 18, dan dikategorikan menjadi tiga tingkat pengetahuan: skor 6–10 menunjukkan pengetahuan rendah, skor 11–14 menunjukkan pengetahuan sedang, dan skor 15–18 menunjukkan pengetahuan tinggi.